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GEO-ENGINEERING: A POSSIBLE INSURANCE POLICY

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MICHAEL C. MACCRACKEN

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Abstract:

While rapidly reducing emissions of greenhouse gases is the most obvious approach to reducing the deleterious consequences of the accelerating pace and nature of global climate change, doing so will require a near total shift away from carbon-emitting fuels over the rest of the 21st century. That climate change can be inadvertently induced by human activities has led to consideration of whether advertent steps could be taken to counterbalance the warming influence of greenhouse gases, thus allowing continued benefits from use of fossil fuels while avoiding the dangerous and damaging consequences. Other than reducing atmospheric concentrations of greenhouse gases, the global-scale approaches that have been proposed would accomplish this by either limiting incoming solar radiation above the Earth's atmosphere or increasing reflected solar radiation by altering stratospheric opacity, cloud reflectivity in the troposphere, or surface albedo. To date, none of the proposed approaches is capable of counterbalancing all of the most important impacts of fossil fuel use, although a few, while inducing some side effects, appear capable of limiting some of the most adverse consequences if implemented in the near future and continued for centuries into the future. As a consequence, global-scale geoengineering appears to merit research into the many uncertainties regarding such schemes in the context of developing a global, societal insurance policy against particularly large or abrupt shifts in climate or sea level.